Patent Claims

1. Method for monitoring a reference half cell (3), wherein the reference half cell (3) forms with a measuring half cell (2) a measuring point (1) for determining and/or monitoring an ion concentration of a medium (7) and wherein the ion concentration of the medium (7) is determined on the basis of at least one measurement signal determined between the measuring half cell (2) and the reference half cell (3),
characterized in that
the measuring point (1) is intermittently operated in an operating mode and in a test mode,
the ion concentration is measured in the operating mode, and
the proper functioning of the reference half cell (3) is checked in the test mode.

2. Method as claimed in claim 1,
characterized in that
the noise component of the measurement signal is determined in the test mode and in the operating mode.

3. Method as claimed in claim 2,
characterized in that
in the test mode, an impedance is activated in the measuring circuit for the determining of the noise component, and
in the operating mode, the impedance (12) is changed.

4. Method as claimed in claim 3,
characterized in that
for the purpose of changing the impedance (12), an impedance-changing-element (13) is activated.

5. Method as claimed in claim 3 or 4,
characterized in that
as impedance-changing-element (13), a switch is actuated, which is connected in parallel with the impedance (12) for the purpose of changing the impedance (12).

6. Method as claimed in claim 1, 2 or 3,
characterized in that
the noise components of the measurement signals in the operating mode and in the test mode are measured, and
a malfunctioning of the reference half cell is recognized on the basis of the relationship of the changes of the noise components in the operating mode and in the test mode, and a corresponding report is output.

7. Method as claimed in claim 6,
characterized in that
the noise components of the measurement components, or the relationships of the changes of the noise components of the measurement signals in the operating mode and in the test mode are continually stored, and
a report is output, concerning after which length of time the reference half cell (3) will probably exhibit a malfunction.

8. Apparatus for monitoring a reference half cell (3), wherein the reference half cell (3) forms with the measuring half cell (2) a measuring point (1) for determining and/or monitoring an ion concentration of a medium (7), and wherein a control/evaluation unit

(11) is provided, which determines the ion concentration of the medium (7) on the basis of a measurement signal determined in a measuring circuit between the measuring half cell (2) and the reference half cell (3),
characterized in that
the control/evaluation unit (11) operates the measuring point (1) intermittently in an operating mode and in a test mode, and
the control/evaluation unit (11) determines the ion concentration of the medium (7) in the operating mode and checks the proper functioning of the reference half cell (3) in the test mode.

9. Apparatus as claimed in claim 8,
characterized in that
in the measuring circuit, an impedance (12) is provided, which is changed, preferably short-circuited, in the operating mode and is added into the measuring circuit in the test mode.

10. Apparatus as claimed in claim 9,
characterized in that
an impedance changing element (13) is provided, which is connected in parallel with the impedance (12), wherein the impedance changing element (13) is actuated by the evaluation/control unit (11).

11. Apparatus as claimed in claim 8, 9 or 10,
characterized in that
the control/evaluation unit (11) interprets a change of the relationship of the noise components in the operating mode and in the test mode as an indication that the reference half cell (3) is working correctly,

as soon as the change lies above a predetermined threshold value.

12. Apparatus as claimed in claim 11,
characterized in that
the control/evaluation unit (11) outputs a malfunctioning of the reference half cell (3), when the relationship of the noise components of the measurement signal in the operating mode and in the test mode is approximately unchanged.

13. Apparatus as claimed in claim 11 or 12,
characterized in that
the control/evaluation unit (11) uses statistical evaluation methods for recognizing a malfunctioning, or the correct working, of the reference cell (3).